

# SUNFLOWER WHITE RUST – *ALBUGO TRAGOPOGONIS*, A NEW DISEASE FOR THE NORTH-EAST BĂRĂGAN AREA

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## Abstract.

The sunflower, *Helianthus annuus*, is a cultivated species which is attacked by many diseases, such as: blight produced by *Plasmopara helianthi* (sin. *P. halstedii*) fungus, white rot produced by *Sclerotinia sclerotiorum* fungus, black spotting produced by *Phoma oleracea* var. *helianthi* fungus, sunflower's brown spotting and stems' breaking produced by *Diaporthe helianthi* f. c. *Phomopsis helianthi* fungus and brown rot produced by *Botrytis cinerea* fungus etc. (Iacob Viorica, Hatman, M., Ulea, E., Puiu, I., 1998, Velichi, E. 2012) In the North-East of Brăila County, attacks of a pathogenic agent which presents symptoms which had not been signalled in the previous years have been observed during 2017. These attacks have been signalled on the sunflower leaves, starting with the middle of June, more affected being the leaves from the lower half of the plants. After the attack was signalled, samples of leaves that presented attack symptoms have been taken. These samples have been examined first of all at the stereo-microscope, being observed the presence of some blisters which had the membrane broken, here and there, showing a matter with an aspect somewhat dusty. From this matter, a preparation on microscopic slide was executed, in glycerine, after which it was examined at the optic microscope. The careful observation has confirmed it is about the caduceus sporangia of *Albugo tragopogonis* fungi which produce the disease known in other countries (U.S.A., South Africa) under the name of white rust. The pathogen frequently attacks the sunflower in these states, having sometimes an invasive character. The disease is mentioned in our country by Vera Bontea in the paper "Saprophytic and Parasitic Fungi from Romania, Vol. II" as being present at some species of plants from *Asteraceae* (*Compositae*) family, out of which the most known is the thistle (*Cirsium arvense*). The attack of this fungus on sunflower in our country is not mentioned in this paper. Up to present, the causes which have determined the occurrence of this pathogen in Romania are not known.

**Key words:** Sunflower, *Albugo tragopogonis*, *Asteraceae*

Sunflower crop is a crop which occupies large areas in Brăila County, being one of the most gainful cultivated species.

However, sunflower has the disadvantage of being attacked by many pathogenic agents, especially fungi, and in a smaller measure bacteria. Among the pathogenic agents, the most damaging have proven to be: the blight produced by *Plasmopara helianthi* (sin. *P. halstedii*) fungus, the black spotting produced by *Phoma oleracea* var. *helianthi* fungus, the brown spotting and stems' breaking produced by *Diaporthe helianthi* f. c. *Phomopsis helianthi* fungus, the white rot produced by *Sclerotinia sclerotiorum* fungus and in the rainy years, the brown rot produced by *Botrytis cinerea* fungus. For the first time in Braila County, the symptoms of a disease which had not been signalled in the previous years have been observed in the year 2017, being a first for this county.

## MATERIAL AND METHOD

The observations had been made by random check, in field conditions, in the second part of June and in the first part of July, to sunflower crops having as purpose seed production (lots of hybridization), as well as consumption crops. The purpose of these observations has been following the dynamic of the occurrence of sunflower blight, *Plasmopara halstedii*, which is a damaging agent, found on the quarantine list according to Romanian legislation. The sunflower hybridization lots must be mandatorily controlled regarding the dynamic of this pathogen, during the performance of this control, a series of symptoms which presented an aspect not met before at sunflower had been observed on the plants' foliage. Samples had been taken from the foliage affected of the plants. They had been analyzed at the laboratory of Brăila's Phytosanitary Office at stereo-microscope and optic microscope. For the observations at the optic microscope, microscopic preparations had been made by using glycerine as fixing liquid.

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The observations had been made in the radius of the following localities: Grădiștea, Racovița and Măxineni, situated in the N – NE part of Brăila County.

## RESULTS AND DISCUSSIONS

The observations had been made to the sunflower hybridization lot of Pioneer company, set up at SC Intercrops SRL Brăila - Racovița work point, as well as to sunflower consumption lots at S.C. Agrifarm S.R.L. Racovița, S.C. Agroholding S.R.L. Măxineni, as well as to some producers which cultivated smaller areas in the radius of Grădiștea locality. It was observed that the attack had affected the plants' foliage, especially in the lower part of the plants (*fig. 2a, fig. 3a*). All plants presented attack symptoms, so that the attack's

frequency (F %) was assessed as being 100%. In what concerns the attack's intensity (I%), its attack was appreciated at values comprised between 10 and 25%. In conclusion, the degree of attack ( $D.A\% = FxI/100$ ) was comprised between 10 and 25%. The attack was manifested relatively uniformly, to all sunflower cultivars (foreign hybrids, as well as to the Romanian hybrid, Favorit) used by the farmers from the area.

The observations made at the stereo-microscope on the plants (leaves) samples, have shown the presence of some blisters with white membrane. They presented a shredded aspect here in there, letting room to see a matter with powdery aspect. Following to studying the powdery contents at the optic microscope, round sporangia of the fungus had been observed.

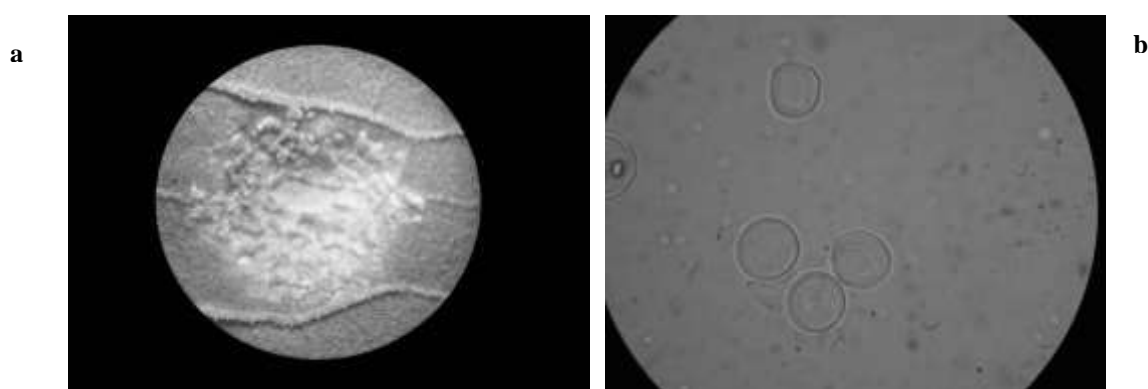


Figure 1 *Albugo tragopogonis* at sunflower: a – detail at stereo-microscope (original), b – sporangia (original)

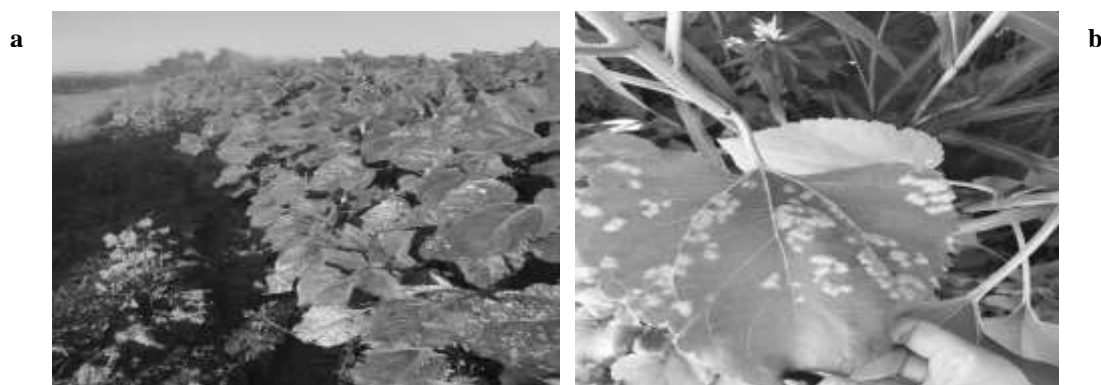


Figure 2 Attack of *Albugo tragopogonis* fungus at the sunflower: a – plants attacked in Grădiștea locality, Brăila county, b - plants attacked in Racovița locality, Brăila county (original)

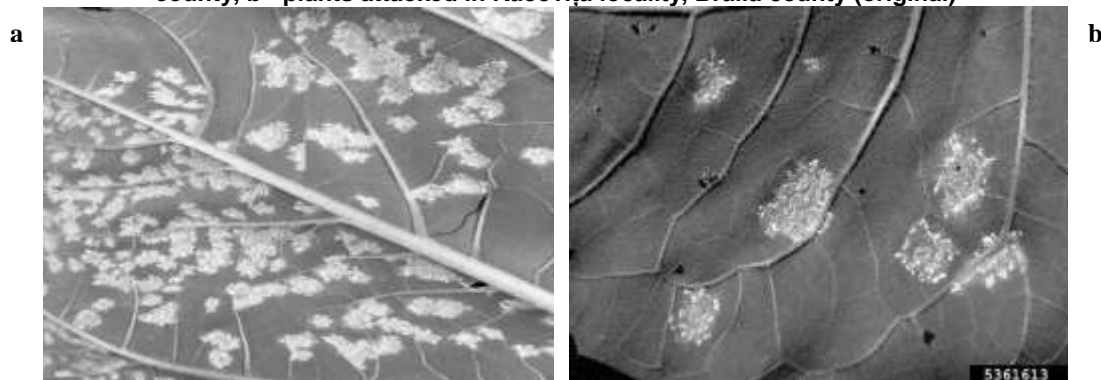


Figure 3 Attack of *Albugo tragopogonis* fungus at the sunflower: a – plants attacked in Grădiștea locality, Brăila county (original), b - symptoms produced on the inferior part of the leaves (according to Howard F. Schwartz)



Figure 4 The geographic position of the Gradiștea -1, Racovița – 2, and Măxineni - 3 villages on the map of Brăila county where the attack of the *Albugo tragopogonis* fungus has been observed. The geographic position of Brăila county on the map of Romania

## CONCLUSIONS

Based on the macro- and microscopic observations, as well as consulting the specialty literature, the following conclusion has been reached: it is about the attack of *Albugo tragopogonis* (DC) Gray 1821 fungus which produces the disease called the “sunflower white rust”. As far as we know, the existence of the attack of this fungus at sunflower has not been notified in Romania up to present.

The systematic classification of the fungus according to Ainsworth, Sparrow and Sussman (1973) and according to Smith, Dunez, Lelliot, Philips and Archer (1988), is the following:

-Phylum *Fungi*; Sub-phylum *Mastigomycotina*, Cl. *Oomycetes*, Ord. *Pernosporales*, Fam. *Albuginaceae*, Gen. *Albugo* (sin. *Cystopus*), Sp. *tragopogonis*.

-Sin. *Cystopus tragopogonis* (DC.) J. Schröt, *Cystopus cubicus* de Bary, *Uredo tragopogonis* DC.

The attack of the fungus has been observed especially at genetically modified sunflower hybrids

that can be harvested by using the Pulsar and Express herbicides

The fungus had a weak attack on the Romanian „Favorit” hybrid. This is a sunflower hybrid that is harvested through conventional methods.

The presence of the fungus has been observed on sunflower crops that have been harvested on cold, heavy clay soils.

The fungus is mentioned in our country at some species of plants from *Asteraceae* (*Compositae*) family, widely spread in the area, such as, for example, the thistle (*Cirsium arvense*).

Until present day the causes that have lead to the observation of the fungus’ attack on sunflower in Romania remain unknown

In what concerns the sunflower, the pathogen was signalled in 1929 in South Africa, in 1972 in Australia (P. S. van Wyk1, B. L. Jones, A Viljoen and I. H. Rong 1995). It is also signalled in the United States (Howard F. Schwartz 2010). The pathogen was also signalled in Belgium (C. Crepel, S.Inghelbrecht G. Bobev 2004).

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